

Air Force Civil Engineer Center

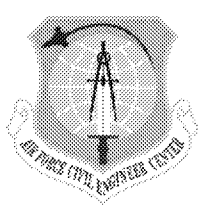
FORMER
WILLIAMS AIR FORCE BASE

**Site LF004 Landfill
Remedial Action**



**BCT Conference Call
15 December 2016**

Battle Ready...Built Right!



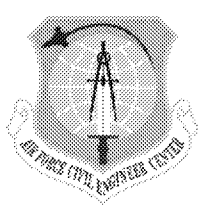
Site LF004

Former AST SVE System Update

Operations Summary through 2 Dec 2016

- Installed vapor monitoring probe (VMP11-D) south of SVE6-D in Aug 2016
- A grab groundwater sample collected approximately 5 ft. below the air water interface during drilling of VMP11-D indicated TCE concentrations of 0.24 $\mu\text{g/l}$ in groundwater
- Analytical data (Sep 2016) indicates TCE and PCE concentration remained below soil vapor goals (SVSLs) in all SVE wells and VMPs except SVE6-D (2.7 mg/m^3 vs 2 mg/m^3) and VMP11-D (13 mg/m^3 vs 2 mg/m^3)
- SVE6-D reconnected to SVE system in Oct 2016
- VMP11-D connected to SVE system on 12 Oct 2016. Initial PID reading decreased from 1,053 ppmv to 27 ppmv. Current PID readings stable at 24.5 ppmv. Performance samples collected for laboratory analysis. 0.5 pounds removed since 4 Nov 2016.

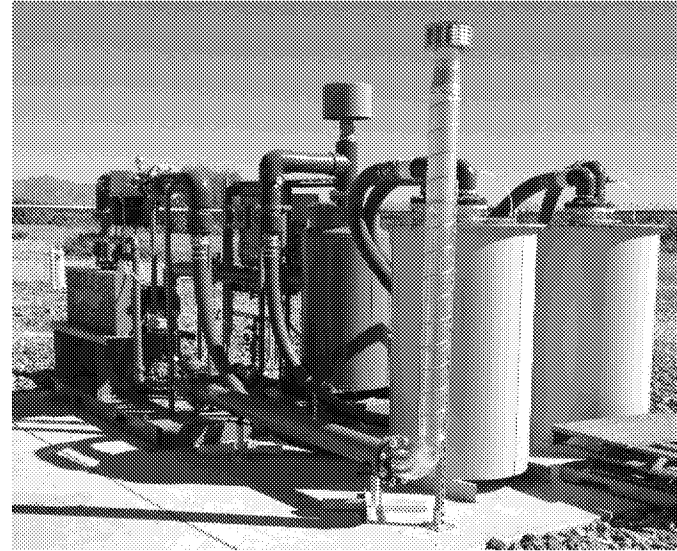


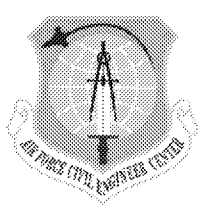


LF01-W17 Area IWAS System Update

Operations Summary through 2 Dec 2016

- Began operation 29 Aug 2014 (approximately 22 months of operation)
- Average 99% operational uptime for reporting period
- TCE and PCE concentrations in extracted vapor are 35 and 78 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), respectively (Oct 2016); extracted vapor concentrations remain low.
- Estimated 10.8 pounds of TCE and PCE removed by vapor extraction
- Oxidant injection at LF01-W30M completed in Aug 2016. Oxidant screening indicates residual oxidant concentrations of approximately 30 mg/L.
- All remediation wells operating except RW01A and RW01D which are undergoing repairs
- Preliminary Dec PDB results indicate only W17S and W17M were above MCLs at 5.8 $\mu\text{g}/\text{l}$ and 8.1 $\mu\text{g}/\text{l}$ for TCE



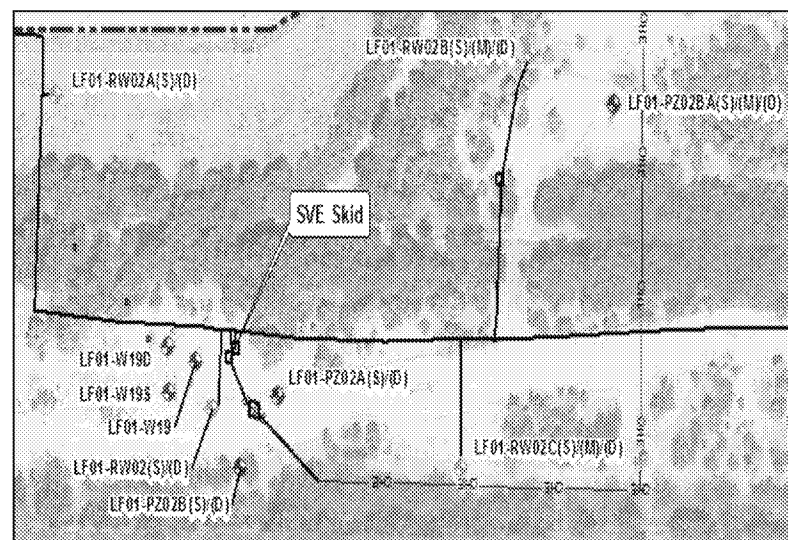


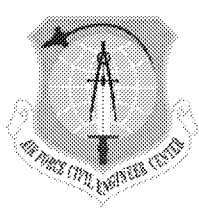
Site LF004

Southern Area Oxidant Injection

Activity Summary through 2 Dec 2016

- Began operation 15 Sep 2014 (approximately 22 months of operation)
- Field screening of residual oxidant ongoing
- Last injection completed week of 27 Feb 2016 at LA06-S and W19-S
- Oxidant concentrations were approximately 3 mg/L in LF01-W19 area and 6 to 31 mg/L in LF01-W24 area at beginning of Dec 2016
- Preliminary Dec PDB results indicate only three PCE MCL exceedances:
W19S 13 µg/l (12 µg/l dup), W24S at 6.4 µg/L and W24M at 6.2 (5.4 dup) µg/l





LF004 Remediation System Recent and Upcoming Activities

- Operation of IWAS and Southern Area remediation wells will continue
- Focused extraction at SVE6-D and VMP11-D (AST) by SVE system
- Quarterly vapor samples collected and results will be reported in early Jan 2017
- Preliminary groundwater semi-annual sampling results just received and are being reviewed and validated
- Landfill repairs completed in Oct 2016; Inspection report in progress
- Posting of analytical data to Sharepoint will continue as results are available (last update – 25 Oct 2016)
- Draft LF004 Operating Properly and Successfully report submitted for regulatory review on 18 Nov 2016.

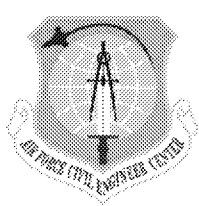
Air Force Civil Engineer Center



***FORMER
WILLIAMS AIR FORCE BASE
Site ST012***

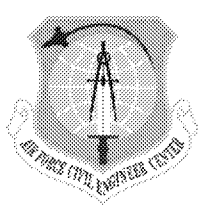
**Former Liquid Fuel
Storage Area**

**BCT Conference Call
15 December 2016**



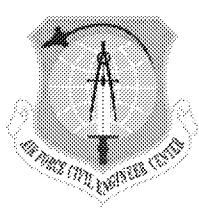
Site ST012 Outline

- **Summary of Activities Since November BCT Call**
- **Perimeter Groundwater Monitoring**
- **LNAPL Monitoring Update**
 - LNAPL Gauging/Removal
- **Field Variance Memorandum Status/Implementation**
 - FVM4 - Additional Characterization Status
 - FVM5 - Containment Status

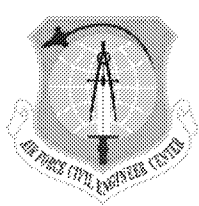


Site ST012 Activities Since November

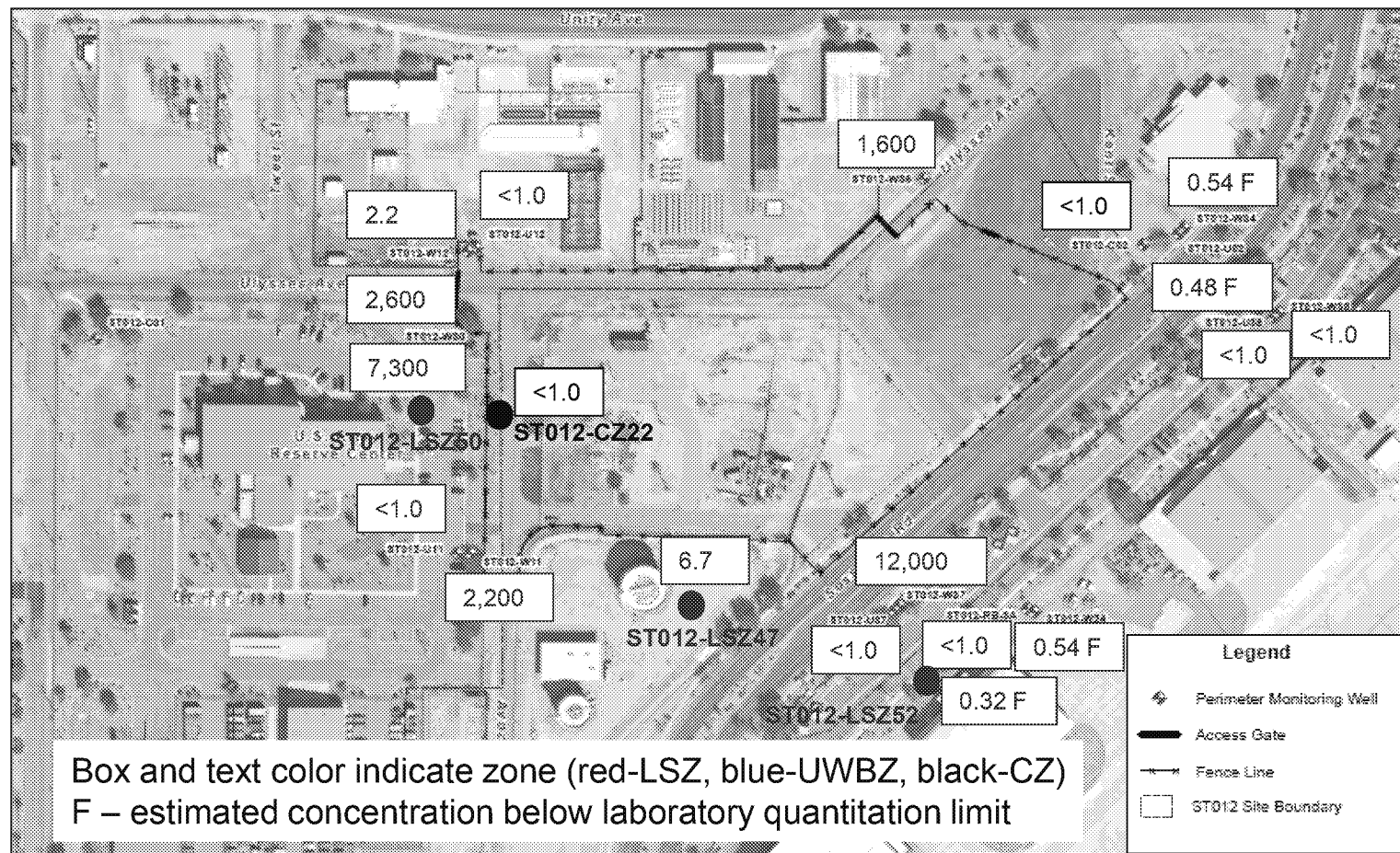
- **Continued SVE operation**
- **Continued LNAPL screening in accessible SEE wells and Phase I characterization wells**
- **Continued installation of additional characterization locations**
- **Continued installation of containment system**



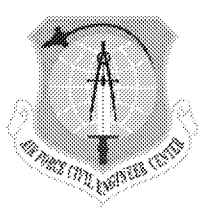
Perimeter Groundwater Monitoring



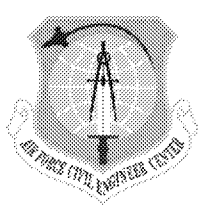
Site ST012 Preliminary Oct-Nov Perimeter Benzene Concentrations ($\mu\text{g/L}$)



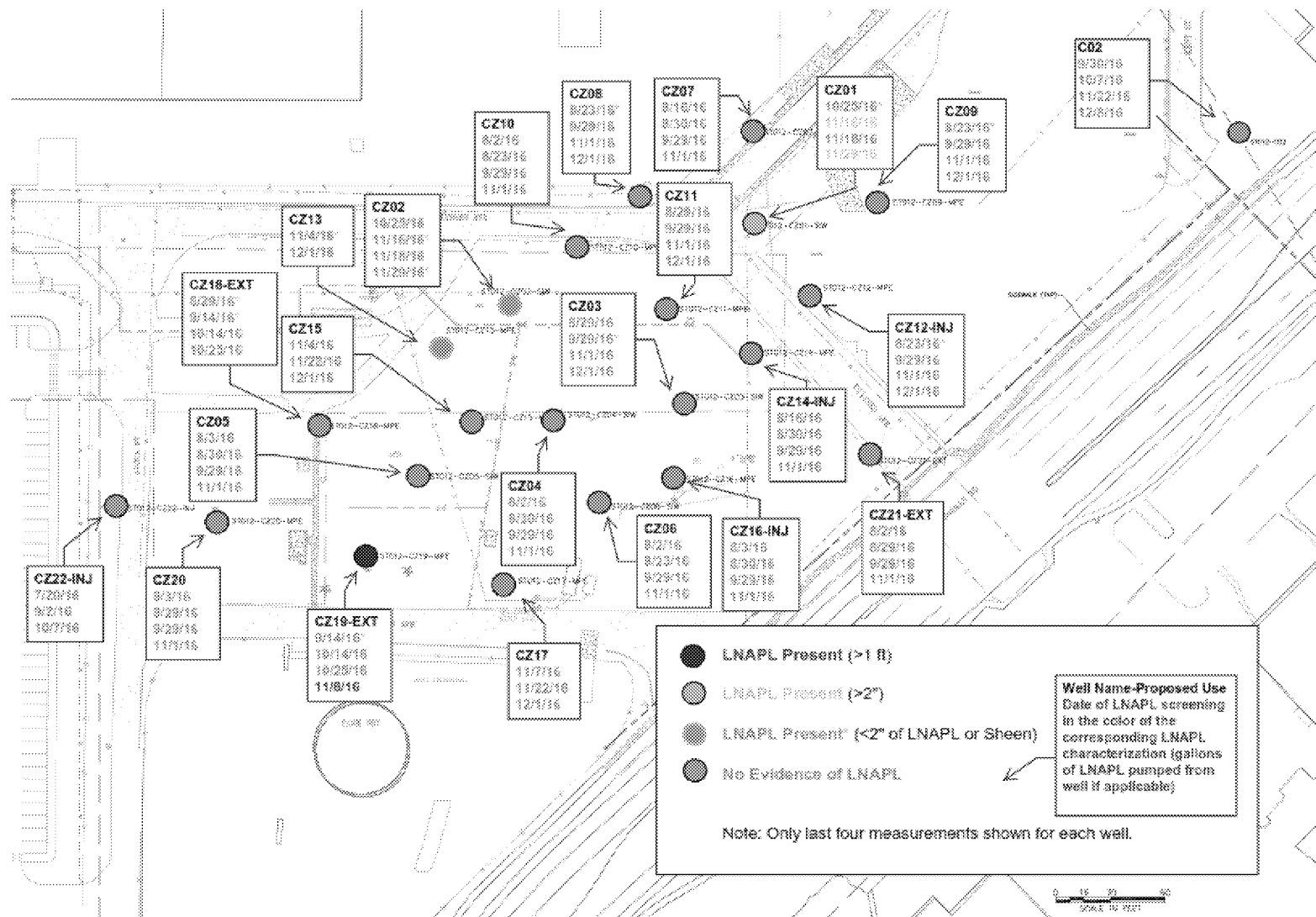
- ST012-W11, -W30, -W37, and LSZ50 samples reflect LNAPL in vicinity
- ST012-W36 concentration has been increasing
- ST012-LSZ52 decreased to below MCLs
- Benzene concentration at other downgradient locations were below MCLs

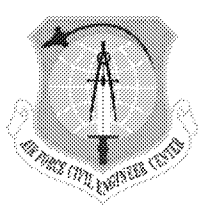


LNAPL Monitoring Update



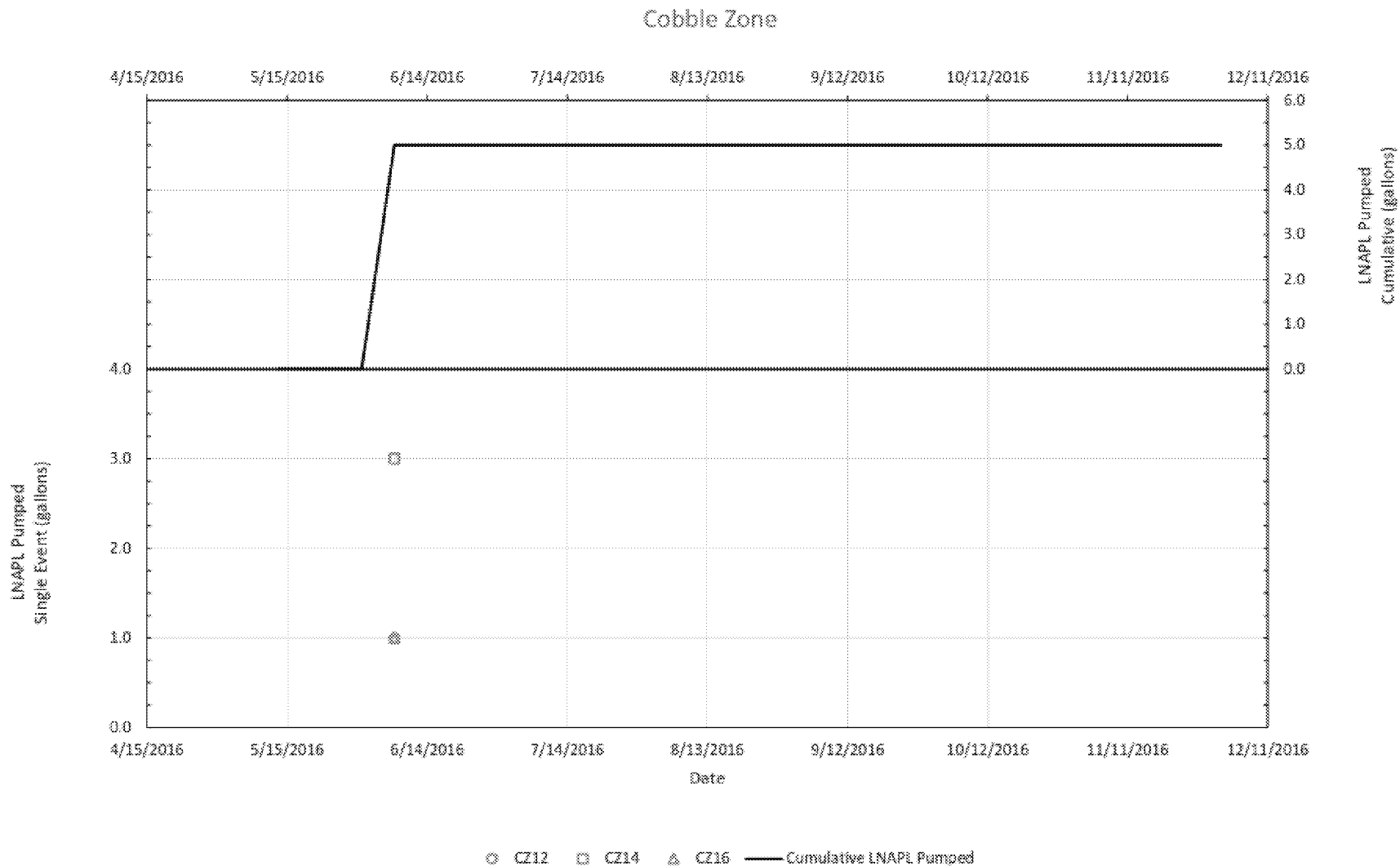
LNAPL Monitoring/Removal Status Cobble Zone

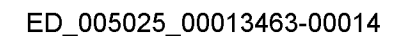


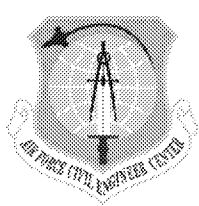


LNAPL Monitoring/Removal Status

Cobble Zone

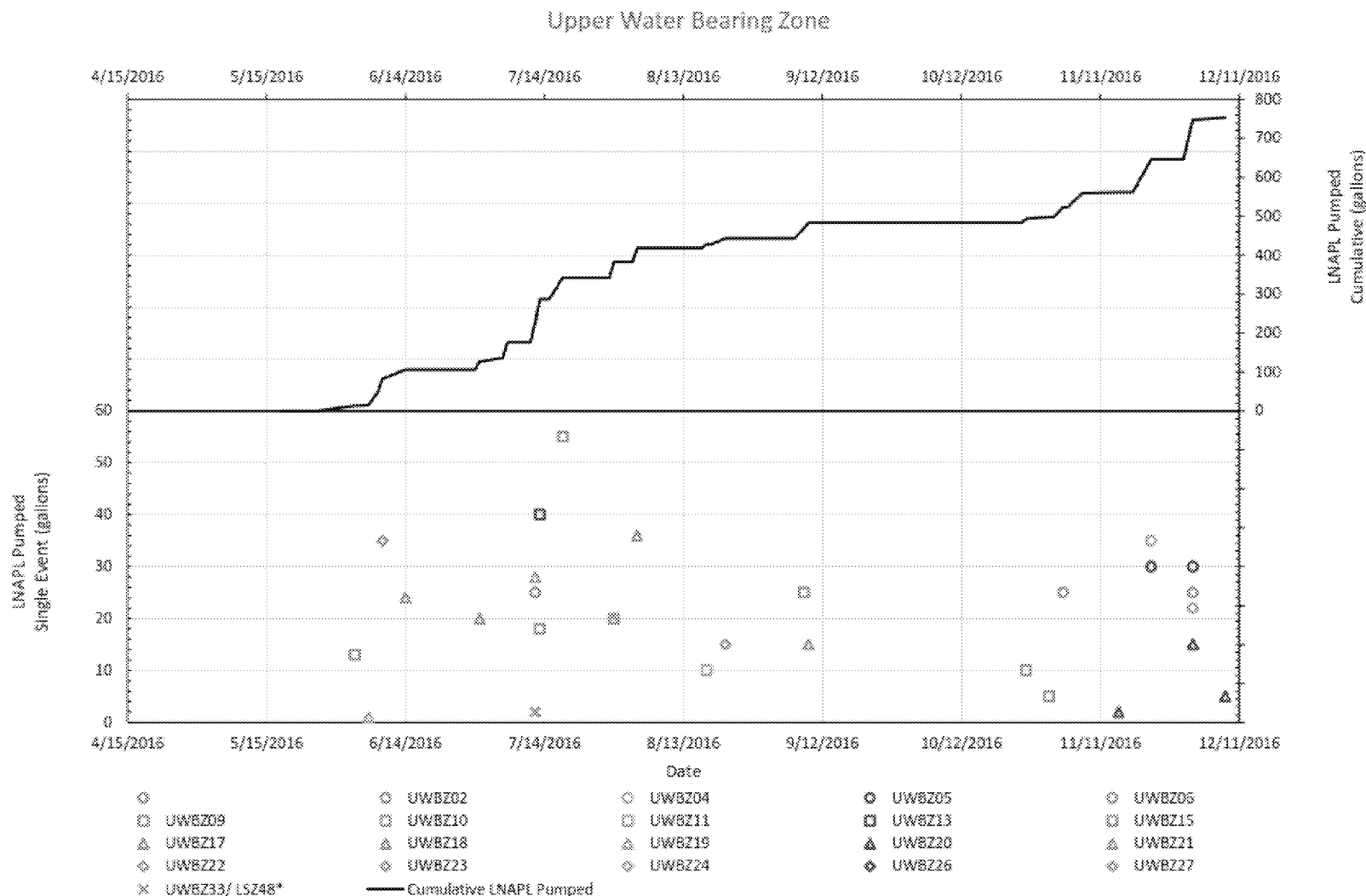


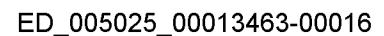


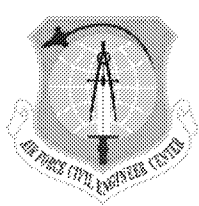


LNAPL Monitoring/Removal Status

Upper Water Bearing Zone

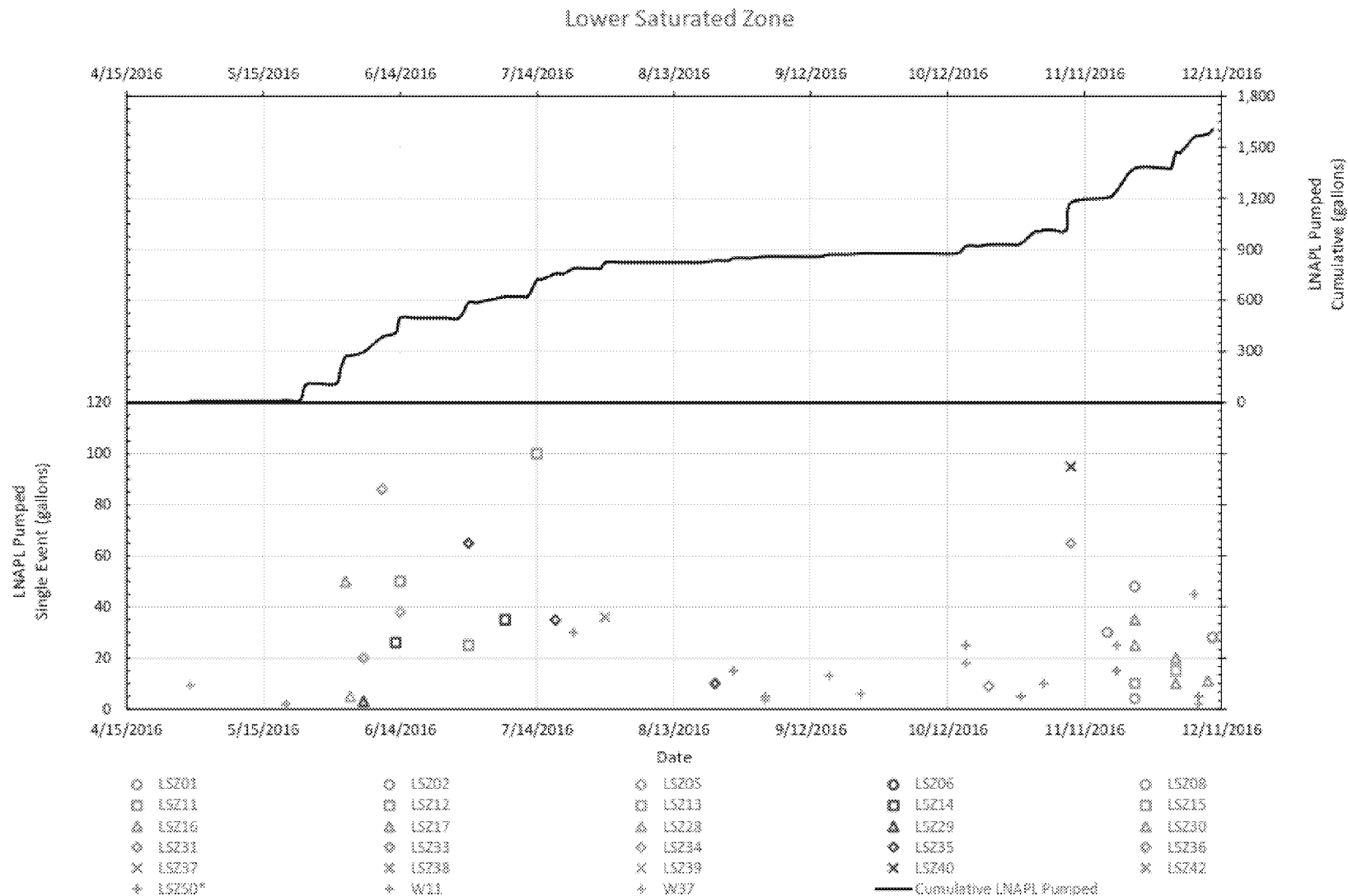




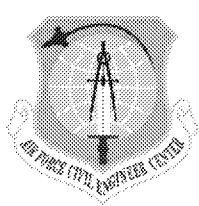


LNAPL Monitoring/Removal Status

Lower Saturated Zone

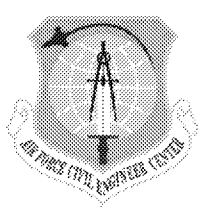


12/14/2016



ST012 LNAPL Monitoring/Removal Summary

- **CZ – ~5 gallons of LNAPL removed. None removed since early June.**
- **UWBZ - ~750 gallons of LNAPL removed. ~475 gallons removed during initial screening (through July). ~275 gallons removed following remaining eductor removals (~175 gallons of that since last call).**
- **LSZ - ~1,700 gallons of LNAPL removed. ~850 gallons removed during initial screening (through July). ~850 gallons removed following remaining eductor removals (~700 gallons of that since last call).**




FVM Implementation Status



-  Upper Water-Bearing Zone Groundwater Monitoring Well Location
-  Cobble Zone Groundwater Monitoring Well Location
-  Lower Saturated Zone Groundwater Monitoring Well Location
-  Soil Boring Location

EBR Well Location

~~~~~ Fence Line

 STD12 Site Boundary

**Notes:**

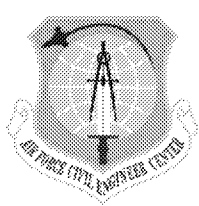
\* Installation of well is contingent on additional sampling. See Drilling Plan table for details.

DTG12-43245 User Identification

EBR Edward Bernbach

Yellow highlighted wells have been installed

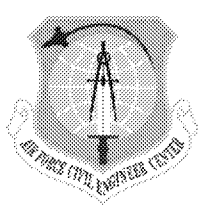
- **FVM**  
**finalized on**  
**1 Dec 2016**



# ST012 FVM4 - Additional Characterization

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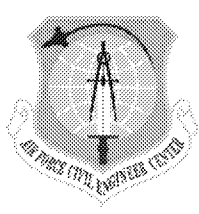
- **The following locations completed since November BCT call:**
  - **ST012-UWBZ37/LSZ53 – High PID (264 ppmv) and positive dye test result in CZ; high PID (264 ppmv) but negative dye test in UWBZ; UWBZ well not installed; LSZ screen installed as planned (205-230 ft bgs)**
  - **ST012-CZ23 – No significant PID readings; screen installed 140-160 ft bgs; sump provided as contingency for pumping (160-170 ft bgs)**
  - **ST012-SB17/LSZ55 – SB-17 shifted south based on logistics. No significant PID readings; because of low PID and proximity to planned LSZ55 location, boring completed as LSZ55 (screen 205-230 ft bgs)**
  - **ST012-CZ24/UWBZ38 – No significant PID readings; wells installed as planned (145-160 and 175-195 ft bgs)**
  - **ST012-UWBZ40/LSZ59 - No significant PID readings; UWBZ well screen raised based on geology (165-185 ft bgs); LSZ well installed as planned (205-230 ft bgs)**
  - **ST012-LSZ60 – Installed due to recent LNAPL observed in LSZ47. No significant PID readings; well installed as planned (205-230 ft bgs)**



# ST012 FVM4 - Additional Characterization

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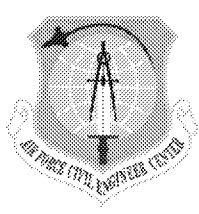
- The following locations were discussed in November BCT call
  - ST012-CZ25, ST012-UWBZ39, ST012-LSZ54, ST012-LSZ56, ST012-LSZ57, ST012-LSZ58, and ST012-SB19/LSZ61
- The following locations not installed
  - ST012-CZ26 – Contingency well, sample results from ST012-CZ22 were below MCLs so this well is not required
  - ST012-UWBZ37 – PID readings > 15 ppmv in the UWBZ (264 ppmv)
  - ST012-SB16 – Positive indications of LNAPL in the CZ and high PID in the UWBZ at UWBZ37/LSZ53 location which is further from the site
  - ST012-SB18 – Planned to start 3 January 2017 due to logistical limitations



# Site ST012 FVM4 – Additional Characterization Path Forward

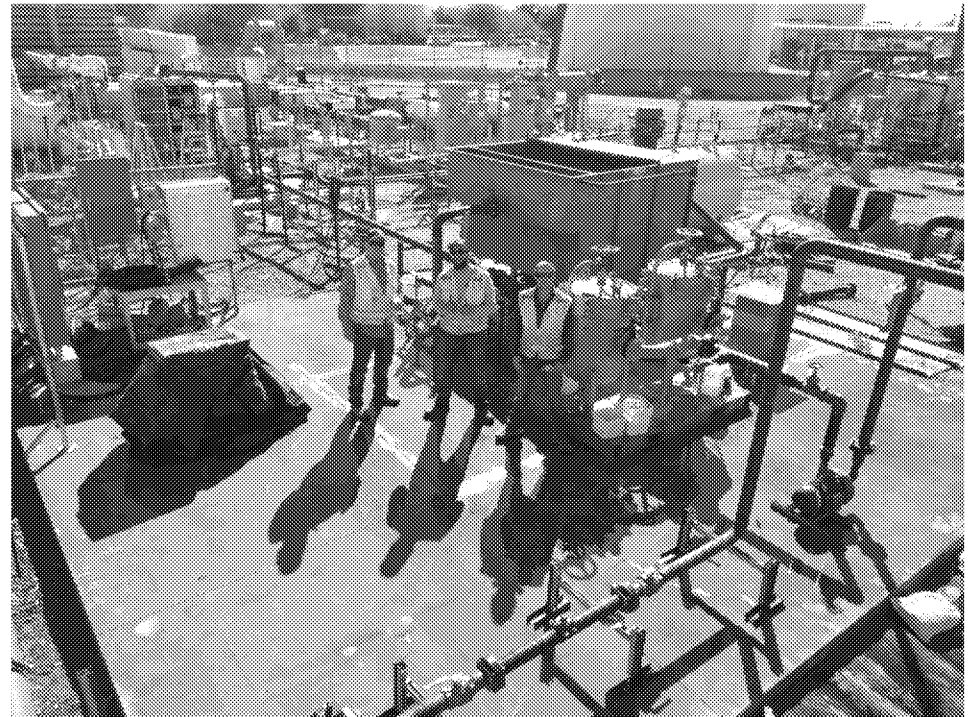
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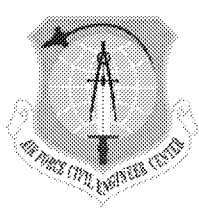
- **Well development (ongoing)**
- **Well sampling (start ~19 December)**
- **Complete last boring/well (SB-18), develop and sample (if well installed)**
- **Post results to Sharepoint in January**
- **Evaluate results relative to containment and future characterization needs for February BCT meeting**



# ST012 FVM5 - Containment

- **Construction Progress**
  - **Mechanical Installation Complete**
  - **Electrical Installation Complete**
  - **Instrumentation Installation 90% Complete – working on final wiring**
  - **Well Pump Installation Complete (except hot wells)**



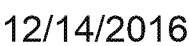


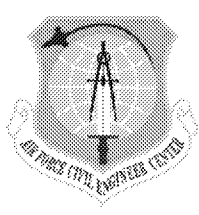
# ST012 FVM5 - Containment

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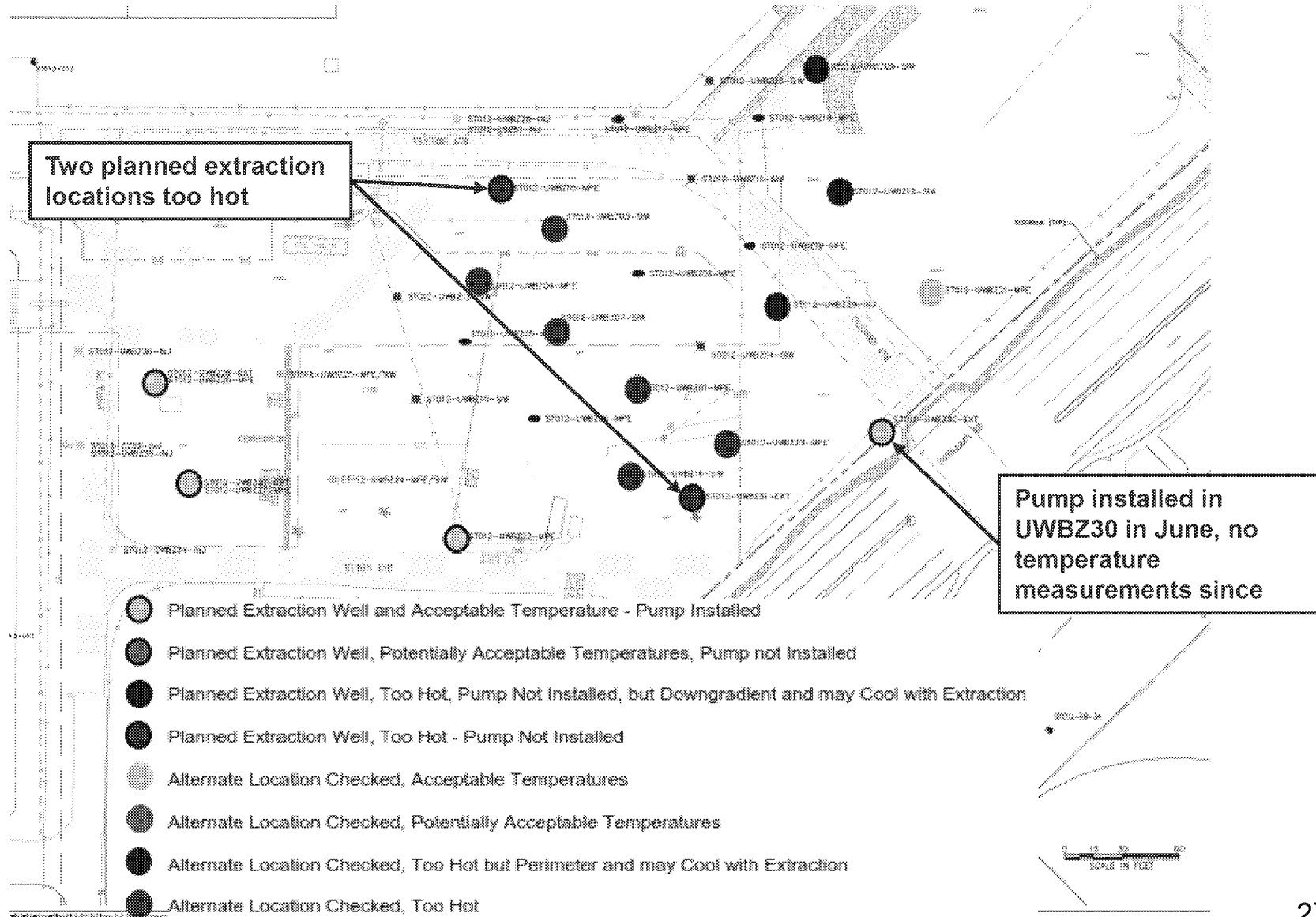
- **Other Activities**

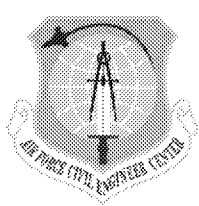
- **Issued final FVM on 1 December 2016**
- **Met with Chemical Supply vendor**
  - Reviewed existing chemical inventory left over from SEE
  - Refined initial chemical injection locations and concentration (recommended change in biocide)
  - Identified and ordered supplemental injection equipment and chemicals
- **Met with City of Mesa to inspect installed equipment**
  - Discussed and obtained verbal approval for alternate biocide
  - Expect City to issue new permit before end of December
- **Completed temperature screening of extraction wells**
- **Started particle track pathway analysis to demonstrate hydraulic capture**





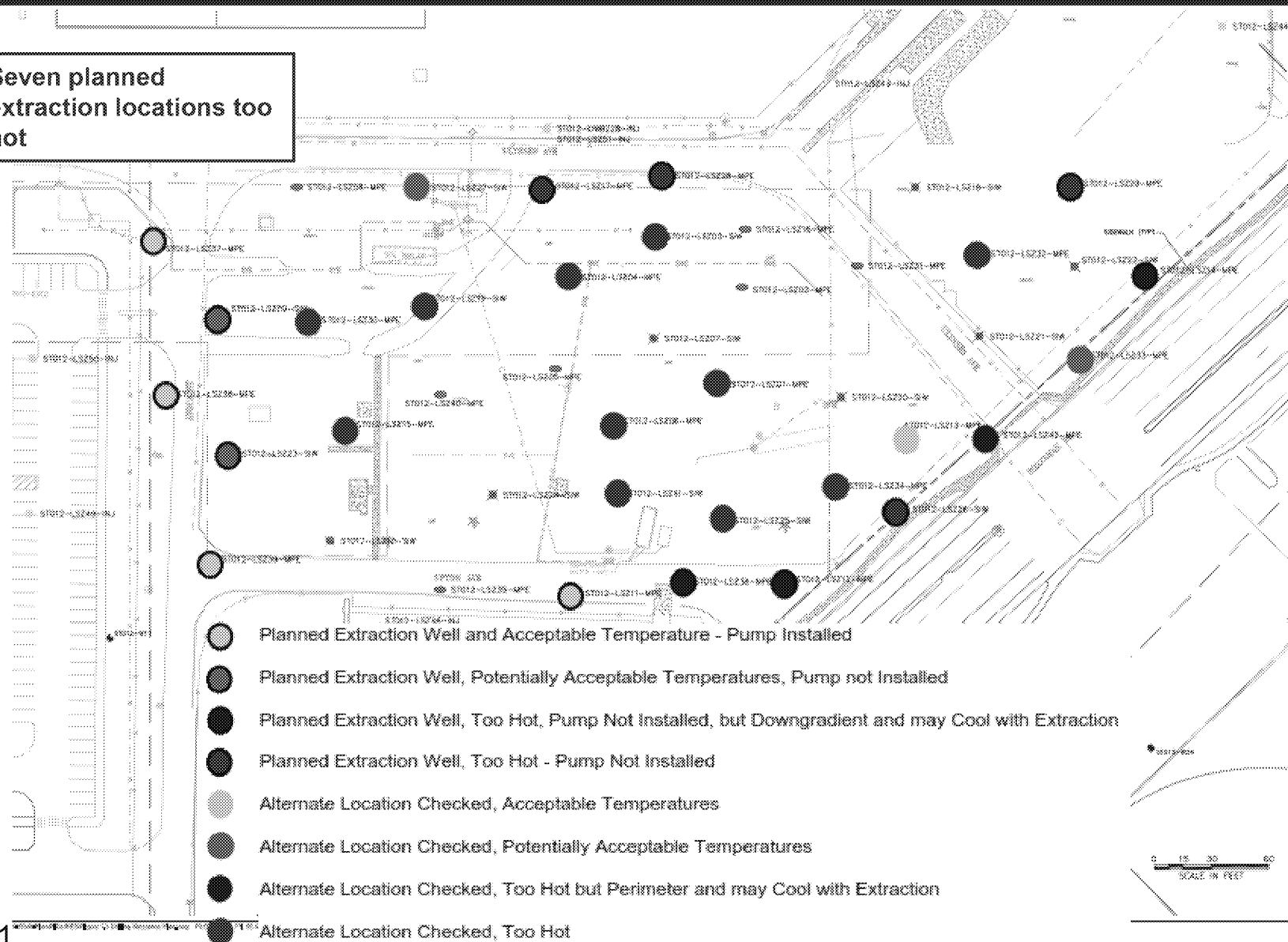
# Temperature Results in Extraction Well Locations - UWBZ

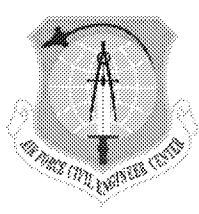




# Temperature Results in Extraction Well Locations - LSZ

Seven planned extraction locations too hot





# **Site ST012 FVM5 – Containment Path Forward**

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- **Receive Revised Discharge Permit (end of Dec 2016)**
- **Install Chemical Injection Equipment (week of 2 Jan 2017)**
- **Start system commissioning (9 Jan 2017)**
- **Finalize Particle Track Pathway Analysis (week of 9 Jan 2017)**
- **Install additional extraction pumps if necessary (start week of 9 Jan 2017)**
- **Ready to operate by 23 Jan 2017**
- **Decision to operate pending:**
  - **AF-ADEQ-EPA discussion on EBR vs active containment**
  - **Preliminary sampling results from additional characterization wells**

# **Air Force Civil Engineer Center**

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## ***REGULATORY DELIVERABLE TRACKING***

**BCT Conference Call  
15 December 2016**

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# Air Force Civil Engineer Center

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## ***BCT MEETINGS/CONFERENCE CALLS SCHEDULE***

**BCT Conference Call  
15 December 2016**

# Air Force Civil Engineer Center

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## ***ACTION ITEMS***

**BCT Conference Call  
15 December 2016**